

**PLASMA IMMERSION ION IMPLANTATION SYSTEM INCLUDING
A CAPACITIVELY COUPLED PLASMA SOURCE HAVING LOW
DISSOCIATION AND LOW MINIMUM PLASMA VOLTAGE**

5

ABSTRACT

A system for processing a workpiece includes a plasma immersion ion implantation reactor with an enclosure having a side wall and a ceiling and defining a chamber, and a
10 workpiece support pedestal within the chamber having a workpiece support surface facing the ceiling and defining a process region extending generally across the wafer support pedestal. The reactor further includes a gas distribution apparatus for introducing a process gas containing a first
15 species to be ion implanted into a surface layer of the workpiece, and an RF plasma source power generator coupled across the ceiling or the sidewall and the wafer support pedestal for capacitively coupling RF source power into the process zone. The reactor further includes an RF bias
20 generator having an RF bias frequency and coupled to the workpiece support pedestal for applying an RF bias to the workpiece, a second wafer processing apparatus, and a wafer transfer apparatus for transferring the workpiece between the plasma immersion ion implantation reactor and the second
25 wafer processing apparatus.